



DEPARTMENT OF TRANSPORTATION  
HAZARDOUS MATERIALS REGULATIONS BOARD

WASHINGTON, D.C. 20590

16579

[Docket No. HM-69; Amdt. Nos. 171-11,  
173-53, 178-20]

CYLINDER SPECIFICATIONS

The purpose of these amendments to the Department's Hazardous Materials Regulations is to provide a new specification for a nonrefillable cylinder to be used for certain compressed gases, to remove existing authorization for fabrication of Department of Transportation specifications 9, 40, and 41 cylinders, and to require that certain cylinders be shipped in outside protective packagings.

On December 11, 1970, the Hazardous Materials Regulations Board published a notice of proposed rule making, Docket No. HM-69; Notice No. 70-25 (35 F.R. 18879) which proposed these changes.

Several commenters objected to Note 1 of § 173.34(d) (1). Some objections were addressed to the requirement for use of a safety relief valve on specifications 39 cylinders containing liquefied flammable gases, thereby prohibiting the use of other type safety relief devices. It was stated that CGA pamphlet S-1.1 is a standard accepted and used by the industry and that such a standard should be enforced. This standard allows other safety relief devices to be used. The Board notes that although a standard exists, this does not mean its provisions are followed by industry in all respects. It cannot be concluded that this standard is the decisive factor in the safe history of transportation of gases. Although the industry claims a safe history, the actual practices followed are the standards to consider, rather than a permissive standard which may not be fully utilized. Safety relief valves are the devices routinely used by industry on cylinders containing flammable liquefied gases. Other objections related to specifying metal as the construction material for the valve. Since the Board has determined that a valve is desirable in place of a fusible device for liquefied flammable gases, then the valve should be capable of functioning as a valve, i.e., opening and closing. Use of a valve made of materials that would lose their shape, or act as a fusible device after short exposure to elevated temperatures would de-

feat the purpose of the original requirement for a valve. Objections also were made to the prohibition against use of fusible safety relief devices. The Board has re-examined its position in this matter, including consideration of experience under special permits, and has concluded that fusible safety relief devices are not desirable for use with liquefied compressed gases. However, the Board believes that fusible safety relief devices are adequate for use with non-liquefied gases and the rule has been amended accordingly.

Comments made on § 173.301(k) indicated a definite need for clarification of the objective for the outside packaging. The basic design for specification 39 was predicated on this cylinder's transportation in an outside container. Section 173.301(k) (1) as it was proposed, did not clearly express this fact and therefore has been modified. Specification 3E is included in this paragraph because of its specified size limitation.

Objection was raised concerning the 75-cubic-inch container limitation for flammable gases. This limitation is based on extensive experience under special permits and the consideration that, in transportation, nonreusable cylinders of larger sizes would be used in place of the higher-integrity reusable cylinders now used in flammable gas service. The Board believes that this usage would degrade the level of transportation safety now established for the shipment of flammable gases.

Requests were made to add products to the table in § 173.304(a) (2), but since these items would be new commodities to be covered by name in the Hazardous Materials Regulations, a separate rule-making action would be required.

Several of the comments concerned the specification itself. One commenter suggested an upper design pressure limit of 3,000 p.s.i., stating that the Board should not exceed that limit unless a need and justification were demonstrated. Need and justification for pressures higher than 3,000 p.s.i. have been demonstrated and several permits are now in effect for pressures above 3,000 p.s.i. The Board considers the design parameters of the specification to be adequate and finds no justification for setting a specified upper design pressure limit.

Some commenters observed that, as written, § 178.65-2 (c) and (d) would require remarking of cylinders for different service and test pressures. However, § 173.34(a) (2) provides for using higher service pressure marked units than are required by the regulations and applies in this circumstance. To avoid ambiguity because of the requirements of § 178.65-14 relating to markings, § 178.65-2(d) has been changed by the addition of the word "maximum".

Comments on § 178.65-3 concerned foreign chemical analyses and test provisions and the requirements for disinterested inspectors for cylinders having a marked service pressure over 900 p.s.i.g. The question of the need for chemical analyses and testing to be performed in the United States is the subject of Docket No. HM-74 (36 F.R. 11224). The manner in which the question is resolved in that docket will have a bearing on the final wording of this section. Meanwhile, the rule is being published consistent with existing requirements. Based on visits to plant sites by Department personnel, the Board believes there is need for disinterested inspectors. There appears to be a higher degree of compliance with Department of Transportation specification requirements where disinterested inspection is required or used even though not required. Therefore, on the basis of available information, the Board is not authorizing the use of interested inspectors for cylinders having a marked service pressure over 900 p.s.i.g.

Two commenters objected to § 178.65-4(c) (1), stating that complete internal and external inspection, particularly if by a disinterested inspector, would present extreme difficulty if high capacity production lines were used. The Board agrees with this observation, and for this inspection only, is authorizing use of an interested inspector. This permits use of qualified production personnel under the overall supervision of assigned inspectors.

Some commenters noted that the steel material specifications would be improved in the interest of safety by a modification of § 178.65-5(a) to guard against age hardening and loss of ductility in a completed cylinder. The Board

acknowledges the correctness of this objection and has amended the rule accordingly.

Objection was raised to the pressure limitation proposed to be placed on cylinders fabricated from aluminum. The Department's knowledge of experience with high pressure aluminum cylinders is very limited. At the present time these cylinders have to be considered experimental. The Board does not consider it appropriate to authorize aluminum cylinders of higher service pressure.

It was pointed out by several commenters that the carbon content of steel should be increased to provide for the use of seamless steel tubing. The Board agrees with this comment and has so provided.

One commenter objected to § 178.65-6(b) (7), which states that welded joints must have a strength equal to or greater than the minimum strength of the shell material in the completed cylinder. This requirement is consistent with § 178.65-11(b) (2), which requires that the entire lot must be rejected if a failure during testing initiates in a weld or its heat affected zone. The objective of the rule is to assure that the weld area is not the weakest point of a completed cylinder. The Board concludes that the rule, as it was proposed, is valid but has modified it to clearly express this objective.

Two commenters objected to the requirement that openings be permitted in ends only. The Board is of the opinion that side openings create greater stress raisers than end openings. The stresses present in a side would be higher than in an ellipsoidal, spherical or flat head. Another commenter objected to the limitation that the diameter of a head opening not exceed 80 percent of the outside diameter of the cylinder. Requests were also made to authorize welded steel tubing in cylinder fabrication and to authorize additional aluminum alloys. The Board has not had the opportunity to fully evaluate these suggested designs and materials and does not have sufficient knowledge of experience in their use. Therefore, it considers these designs and fabrication to be experimental, and will deal with them on an individual rule-making basis. However, in this amendment, the Board is authorizing use of longitudinal or helical welded cylinders up to a 500 p.s.i.g. service pressure on the basis of existing cylinder specifications.

An objection was received on the lot size to be used for testing, suggesting a larger lot size. In a performance oriented specification adequate test requirements are paramount. The Board is concerned that testing be meaningful. To positively relate various tests to the end product, tests must be conducted at a frequency to assure that the unit tested is representative. No data have been presented to the Board to support the contention that a larger lot size could be used with assurance that there would be adequate monitoring of production for this type of packaging.

Objection was raised regarding the severity of the flattening test when compared to stationary vessel standards. The Board recognizes that the flattening test may be more restrictive, but these vessels will be exposed under pressure to a varied transportation environment and greater abuse. The test proposed is similar to testing requirements for other Department of Transportation cylinder specifications.

A commenter objected to the proposed wording of § 178.65-12(a) (2) regarding the inclusion of the weld in the crush test. He observed that the metal adjacent to the weld could be annealed by the welding process and thus would not be representative of the base metal. Since the intent of the crush test is to assure that the base metal remains ductile in the finished condition, the Board agrees with this observation and the rule has been modified accordingly.

A question was raised concerning the need for marking both service and test pressure on the cylinder. Under the concept of this specification, the test pressure is specifically related to the maximum pressure of the contents at 130° F., and the filler needs this information. Therefore, the marking requirement is being retained as proposed.

One commenter considered the statement required by § 178.65-14(b) (8) to be too lengthy. The Board agrees that the statement is longer than any similar statement previously required, but believes that by the emphasis placed on the penalties prescribed by law, the statement will serve as a better deterrent to refilling. The proposed statement is a prime requisite to the safe applicability of this specification in transportation and therefore is being retained.

The Board received several comments on various aspects of the use and disposition of this specification cylinder, and while many of these appeared to have merit, they did not sufficiently relate to transportation safety to be an appropriate matter for the Board's consideration.

In consideration of the foregoing, 49 CFR Parts 171, 173, and 178 is amended as follows:

## PART 171—GENERAL INFORMATION AND REGULATIONS

In § 171.7, paragraph (c) (12) is added to read as follows:

§ 171.7 Matter incorporated by reference.

(c) \* \* \*  
(12) Aluminum Association: The Aluminum Association, 420 Lexington Avenue, New York, N.Y. 10017.

## PART 173—SHIPPERS

(A) In § 173.34 paragraph (d) (1) Note 1 and (d) (2) are amended to read as follows:

### § 173.34 Qualification, maintenance, and use of cylinders.

(d) \* \* \*  
(1) \* \* \*

NOTE 1: Safety relief devices are required on specifications 9, 40, 41, and 39 (§ 178.65 of this chapter) cylinders. Metal safety relief valves are required on specification 39 cylinders used for liquefied flammable gases. Fusible safety relief devices are not authorized on specification 39 cylinders containing liquefied compressed gases.

(2) Except for specification 39 cylinders and cylinders for acetylene in solution, safety relief devices are not required on cylinders charged with non-liquefied gas under pressure of 300 p.s.i. or less at 70° F.

(B) In § 173.301, paragraph (h) Table is amended by adding "DOT-39" in the last column following "DOT-38"; paragraph (k) is added to read as follows:

§ 173.301 General requirements for shipment of compressed gases in cylinders.

(k) Outside packagings. Specifications 2P, 2Q, 3E, 3HT, 4D, 4DA, 4DS, 9, 39, 40, and 41 must be shipped in strong outside packagings.

(1) Outside packagings must provide protection for the complete cylinder against accidental functioning of damage to valves under conditions normally incident to transportation.

(C) In § 173.302 paragraph (a) (4) is added to read as follows:

§ 173.302 Charging of cylinders with non-liquefied compressed gases.

(a) \* \* \*

(4) Specification 39 (§ 178.65 of this chapter). For flammable gases, internal volume must not exceed 75 cubic inches.

(D) In § 173.304 paragraph (a) (1) is amended; paragraph (a) (2) table miscellaneous entries and Note 8 are amended, Note 9 is added; paragraph (d) (3) (i) is amended to read as follows:

§ 173.304 Charging of cylinders with liquefied compressed gas.

(a) \* \* \*

(1) Specifications 3, 3A, 3AA, 3B, 3N, 3D, 3E, 4, 4A, 4B, 4BA, 4B-ET, 4BW, 9, 25, 26, 38, 39, 40, or 41 (§§ 178.36, 178.37, 178.38, 178.39, 178.41, 178.42, 178.48, 178.49, 178.50, 178.51, 178.55, 178.61, 178.63, 178.65, 178.66, 178.67 of this chapter), except that Specifications 9, 39, 40, and 41 containers must not be charged and shipped with mixtures containing pyrophoric liquids, carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, nickel carbonyl, spirits of nitroglycerin, or poisonous materials (class A, B, or C), unless specifically prescribed in this part.

(i) For flammable gases, the internal volume of a specification 39 cylinder must not exceed 75 cubic inches.

\* Use of existing cylinders authorized, but new construction not authorized.

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## PART 17

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Kind of gas	Maximum permitted filling density (see Note 1)	Containers marked as shown in this column or of the same type with higher service pressure must be used except as provided in § 173.34 (a), (b), § 173.301(j) (see notes following table).
***	Percent	***
Liquefied (see Notes 3, 4, 68)	DOT-3A1800; DOT-3AA1800; DOT-3; DOT-3E1800; DOT-3HT2000; DOT-39.	
Nitrous oxide mixture (see Note 8 and 9)	DOT-3A1800; DOT-3AA1800; DOT-3; DOT-3E1800; DOT-3HT2000; DOT-39.	
Ethane (see Note 8)	DOT-3A225; DOT-3AA225; DOT-3B225; DOT-4A225; DOT-4AA225; DOT-4B225; DOT-4BA225; DOT-4BW225; DOT-4E225; DOT-4B240ET; DOT-4E240ET; DOT-4E225; DOT-9; DOT-39.	
Ethane and difluoro- (constant boiling at 130° F.)	DOT-3A240; DOT-3AA240; DOT-3B240; DOT-3E1800; DOT-4A240; DOT-4BA225; DOT-4BW225; DOT-4E240ET; DOT-4E225; DOT-9; DOT-39.	
Ethane (see Note 8)	DOT-3A150; DOT-3AA150; DOT-3B150; DOT-4B150; DOT-4BA225; DOT-4BW225; DOT-3E1800; DOT-39.	
and 9)	DOT-3A1800; DOT-3AA1800; DOT-3; DOT-3E1800; DOT-39.	
and 9)	DOT-3A2000; DOT-3AA2000; DOT-39.	
and 9)	DOT-3A1800; DOT-3AA1800; DOT-3; DOT-3E1800; DOT-39.	
and 9)	DOT-3A2000; DOT-3AA2000; DOT-39.	
and 9)	DOT-3A2400; DOT-3AA2400; DOT-39.	
and 9)	DOT-3A300; DOT-3AA300; DOT-3HT900; DOT-4B300; DOT-4BA300; DOT-4BW300; DOT-4D300; DOT-4DA500; DOT-4DS500; DOT-3E1800; DOT-39.	
and 9)	DOT-3A240; DOT-3AA240; DOT-3B240; DOT-4B240; DOT-4BA240; DOT-4E240; DOT-39; DOT-41; DOT-3E1800.	
and 9)	DOT-3A225; DOT-3AA225; DOT-3B225; DOT-4A225; DOT-4B225; DOT-4BA225; DOT-4BW225; DOT-3E1800; DOT-39.	
and 9)	DOT-3A1800; DOT-3AA1800; DOT-3; DOT-3E1800; DOT-39.	
and 9)	DOT-3A1800; DOT-3AA1800; DOT-3; DOT-3E1800; DOT-39.	
and 9)	DOT-3A225; DOT-3AA225; DOT-3B225; DOT-4A225; DOT-4B225; DOT-4BA225; DOT-4BW225; DOT-4E240ET; DOT-3; DOT-4; DOT-25; DOT-26-150; DOT-39; DOT-3E1800.	

### § 178.65-3 Inspection by whom and where.

Inspection of each cylinder must be performed by a competent inspector with chemical analyses and tests performed within limits of the United States. Disinterested inspectors, acceptable to the Bureau of Explosives, are required for cylinders having marked service pressure higher than 900 p.s.i.g., except as otherwise provided in this section.

### § 178.65-4 Duties of inspector.

(a) The inspector must determine that all material used complies with the requirements of this specification.

(b) The inspector must verify compliance with the requirements of § 178.65-5 by making a chemical analysis or obtaining a certified chemical analysis from the material manufacturer for each heat of material (ladle analysis acceptable). If an analysis is not provided by the material manufacturer, a sample from each coil, sheet, or tube must be analyzed.

(c) The inspector must determine that each cylinder is made and marked in compliance with this specification by:

- (1) Complete internal and external inspection (interested inspectors authorized);
- (2) Verification of proper heat treatment (if any);
- (3) Selection of samples to be tested;
- (4) Witnessing all tests; and
- (5) By preparation of required report.

### § 178.65-5 Material; steel or aluminum.

(a) Steel:

(1) The steel analysis must conform to the following:

	Ladle analysis	Check analysis
Carbon, maximum percent.....	0.12	0.15
Phosphorus, maximum percent.....	0.04	0.05
Sulfur, maximum percent.....	0.05	0.06

(2) For a cylinder made of seamless steel tubing with integrally formed ends, hot drawn, and finished, content percent for the following must not exceed: carbon, 0.55; phosphorus, 0.045; sulfur, 0.050.

(3) For non-heat treated welded steel cylinders, adequately killed deep drawing quality steel is required.

(4) Longitudinal or helical welded cylinders are not authorized for service pressures in excess of 500 p.s.i.g.

(b) Aluminum: Aluminum not authorized for service pressures in excess of 500 p.s.i.g. Analysis of aluminum must conform to Aluminum Association standard designated for alloys 1100, 1170, 3003, 5052, 5086, 5154, 6061, and 6063 specified in its publication entitled "Aluminum Standards and Data" (1970-71 edition dated December 1969).

(c) Material with seams, cracks, laminations, or other injurious defects not permitted.

(d) Material used must be identified by any suitable method.

(C) Section 178.65 is added to read as follows:

### § 178.65 Specification 39; non-reusable (non-refillable) cylinder.

#### § 178.65-1 Compliance.

Each cylinder must meet the applicable requirements of § 173.24 of this chapter.

#### § 178.65-2 Type, size, service pressure and test pressure.

(a) Type: Each cylinder must be of seamless, welded, or brazed construction. Spherical pressure vessels are authorized and covered by references to cylinders in this specification.

(b) Size limitation: Maximum water capacity may not exceed:

(1) 55 pounds (1,526 cubic inches) for a service pressure of 500 p.s.i.g. or less, and

(2) 10 pounds (277 cubic inches) for a service pressure in excess of 500 p.s.i.g.

(c) Service pressure: The marked service pressure may not exceed 80 percent of the test pressure.

(d) Test pressure: The minimum test pressure is the maximum pressure of contents at 130° F. or 180 p.s.i.g. whichever is greater.

(e) The term "pressure of contents" as used in this specification means the total pressure of all the materials to be shipped in the cylinder.

173.301(k).  
used for shipment of flammable gases, liquid, or poisonous, and contents thereof, charged with carbon dioxide, or air.  
methane (see Note 8).

ons 3, 3A, 3AA, 3B, 4A, 4B240ET, 4BW240, 4E, 4, 9, 25, 26, 178.36, 178.37, 178.38, 178.50, 178.51, 178.55, 178.68, 178.48, 178.63, this chapter). The in-a specification 39 cylinder must not exceed 75 cubic inches, the same.

### SHIPPING CONTAINER SPECIFICATIONS

Table of Contents and 178.67 are canceled as follows:

39; non-reusable (non-reusable).

60 ... canceled.

Cylinders authorized, but not authorized.

#### § 178.65-6 Manufacture.

(a) General manufacturing requirements are as follows:

(1) Dirt and scale must be removed prior to inspection and processing.

(2) The surface finish must be uniform and reasonably smooth.

(3) Inside surfaces must be clean, dry, and free of loose particles.

(4) No defect of any kind is permitted if it is likely to weaken a finished cylinder.

(b) Requirements for seams:

(1) Brazing is not authorized on aluminum cylinders.

(2) Brazing material must have a melting point of not lower than 1,000° F.

(3) Brazed seams must be assembled with proper fit to insure complete penetration of the brazing material throughout the brazed joint.

(4) Minimum width of brazed joints must be at least four times the thickness of the shell wall.

(5) Brazed seams must have design strength equal to or greater than 1.5 times the minimum strength of the shell wall.

(6) Welded seams must be properly aligned and welded by a method that provides clean, uniform joints with adequate penetration.

(7) Welded joints must have strength equal to or greater than the minimum strength of the shell material in the finished cylinder.

(c) Attachments to the cylinder are permitted by any means which will not be detrimental to the integrity of the cylinder. Welding or brazing of attachments to the cylinder must be completed prior to all pressure tests.

#### § 178.65-7 Wall thickness.

(a) The minimum wall thickness must be such that the wall stress at test pressure does not exceed the yield strength of the material of the finished cylinder wall.

(b) Calculation of the stress for cylinders must be made by the formula:

$$S = \frac{P(1.3D^2 + 0.4d^2)}{D^2 - d^2}$$

where:

S = Wall stress, in p.s.i.;

P = Test pressure;

D = Outside diameter, in inches;

d = Inside diameter, in inches.

(c) Calculation of the stress for spheres must be made by the formula:

$$S = \frac{PD}{4t}$$

where:

S = Wall stress, in p.s.i.;

P = Test pressure;

D = Outside diameter, in inches;

t = Minimum wall thickness, in inches.

#### § 178.65-9 Openings and attachments.

(a) Openings and attachments are permitted on heads only.

(b) All openings and their reinforcements must be within an imaginary circle, concentric to the axis of the cylinder. The diameter of the circle may not ex-

ceed 80 percent of the outside diameter of the cylinder. The plane of the circle must be parallel to the plane of a circumferential weld and normal to the long axis of the cylinder.

(c) Unless a head has adequate thickness, each opening must be reinforced by a securely attached fitting, boss, pad, collar, or other suitable means.

(d) Material used for welded openings and attachments must be of weldable quality and compatible with the material of the cylinder.

#### § 178.65-10 Safety devices.

Safety devices must meet the requirements of § 173.34(d) of this chapter.

#### § 178.65-11 Pressure tests.

(a) Each cylinder must be tested at an internal pressure of at least the test pressure and must be held at that pressure for at least 30 seconds.

(1) The leakage test must be conducted by submersion under water or by some other method that will be equally sensitive.

(2) If the cylinder leaks, evidences visible distortion, or any other defect, while under test, it must be rejected (see § 178.65-13).

(b) One cylinder taken from the beginning of each lot, and one from each 1,000 or less successively produced within the lot thereafter, must be hydrostatically tested to destruction. The entire lot must be rejected if (see § 178.65-13):

(1) A failure occurs at a gage pressure less than ~~200~~<sup>2.0</sup> times the test pressure.

(2) A failure initiates in a braze or a weld or the heat affected zone thereof:

(3) A failure is other than in the side wall of a cylinder longitudinal with its long axis, or

(4) In a sphere, a failure occurs in any opening, reinforcement, or at a point of attachment.

(c) A "lot" is defined as the quantity of cylinders successively produced per production shift (not exceeding 10 hours) having identical size, design, construction, material, heat treatment, finish, and quality.

#### § 178.65-12 Flattening test.

(a) One cylinder must be taken from the beginning of production of each lot (as defined above) and subjected to a flattening test.

(1) The flattening test must be made on a cylinder that has been tested at test pressure.

(2) A ring taken from a cylinder may be flattened as an alternative to a test on a complete cylinder. The test ring must not include the heat affected zone or any weld. However, for a sphere, the test ring may include the circumferential weld if it is located at a 45 degree angle to the ring,  $\pm 5$  degrees.

(3) The flattening must be between 60 degrees included-angle, wedge shaped knife edges, rounded to a 0.5 inch radius.

(4) Cylinders and test rings must not crack when flattened so that their outer

surfaces are not more than six times wall thickness apart when made of steel or not more than ten times wall thickness apart when made of aluminum.

(b) If any cylinder or ring cracks when subjected to the specified flattening test, the lot of cylinders represented by the test must be rejected (see § 178.65-13).

#### § 178.65-13 Rejected cylinders.

(a) If the cause for rejection of a lot is determinable, and if by test or inspection defective cylinders are eliminated from the lot, the remaining cylinders must be qualified as a new lot under §§ 178.65-11 and 178.65-12.

(b) Repairs to welds are permitted. Following repair, a cylinder must pass the pressure test specified in § 178.65-11(a).

(c) If a cylinder made from seamless steel tubing fails the flattening test described in § 178.65-12, suitable uniform heat treatment must be used on each cylinder in the lot. All prescribed tests must be performed subsequent to this heat treatment.

#### § 178.65-14 Markings.

(a) The markings required by this section must be durable and waterproof. The requirements of § 173.24(c)(1)(ii) and (iv) of this chapter do not apply to this section.

(b) Required markings are

(1) DOT-39.

(2) NRC.

(3) The service pressure.

(4) The test pressure.

(5) The registration number (M\*\*\*\*) of the manufacturer.

(6) The lot number.

(7) The date of manufacture if the lot number does not establish the date of manufacture.

(8) The following statement:

Federal law forbids transportation if re-filled—penalty up to \$10,000 fine and 10 years imprisonment (18 U.S.C. 831-835).

(c) The markings required by paragraph (b)(1) through (5) of this section must be in numbers and letters at least  $\frac{1}{8}$  inch high and displayed sequentially. For example:

DOT-39 NRC 250/500 M1001.

(d) No person may mark any cylinder with the specification identification "DOT-39" unless (1) it was manufactured in compliance with the requirements of this section and (2) its manufacturer has a registration number (M\*\*\*\*) from the Office of Hazardous Materials, Department of Transportation, Washington, D.C. 20590.

#### § 178.65-15 Inspector's report.

(a) The inspector's report must be retained by the manufacturer for a period of 3 years and must be available for examination by representatives of the Department.

(b) The report must be legible, and contain at least the following information:

**INSPECTION REPORT COVERING THE MANUFACTURE OF SPECIFICATION DOT-39 CYLINDERS OR SPHERES**

The cylinders (spheres) covered by this report were manufactured for \_\_\_\_\_ located at \_\_\_\_\_. They were manufactured by \_\_\_\_\_ located at \_\_\_\_\_ whose Department of Transportation registration number is M-\_\_\_\_\_. The cylinders are \_\_\_\_\_ inches in diameter (OD) and \_\_\_\_\_ inches in length. They have a design test pressure of \_\_\_\_\_ p.s.i.g. and a marked service pressure of \_\_\_\_\_ p.s.i.g. Each has an internal volume of \_\_\_\_\_ cubic inches (nominal).

These containers were made by process of \_\_\_\_\_.

The metal used was identified by heat or analysis numbers as shown on the "Record of Chemical Analysis of Metal" attached hereto.

All material and each cylinder was inspected. All accepted material was found free from seams, cracks, laminations, and other defects which might prove injurious to the strength of the cylinder. The processes of manufacture and heat treatment (if any) were observed and found satisfactory.

My record of tests and inspection for each lot covered by this report is as follows:

Lot No.	Lot quantity	Lot tests		All cylinders	
		Burst-pressure <sup>1</sup>	Flattening test <sup>2</sup>	Pressure tests <sup>1</sup>	Visual inspection <sup>2</sup>

<sup>1</sup> Enter the lowest actual failure pressure of all cylinders tested within the lot.  
<sup>2</sup> Enter "Pass" or "Fail".

Inspector's name (print) \_\_\_\_\_

Inspector's signature \_\_\_\_\_

Date \_\_\_\_\_

Inspector's employer (company name) \_\_\_\_\_

§ 178.66 [Canceled]

(D) Section 178.66 is canceled.

§ 178.67 [Canceled]

(E) Section 178.67 is canceled.

This amendment is effective December 31, 1971. However, compliance with the regulations as amended herein is authorized immediately.

(Sec. 831-835, Title 18, United States Code; sec. 9, Department of Transportation Act, 49 U.S.C. 1657; Title VI, sec. 902(h), Federal Aviation Act of 1958, 49 U.S.C. 1421-1430, 1472(h))

Issued in Washington, D.C., on August 17, 1971.

W. F. REA III,  
*Rear Admiral, Board Member,  
 For the United States Coast Guard.*

MAC E. ROGERS,  
*Board Member,  
 For the Federal Railroad Administration.*

KENNETH L. PIERSON,  
*Alternate Board Member,  
 For the Federal Highway Administration.*

R. S. SLIFF,  
*Alternate Board Member,  
 Federal Aviation Administration.*

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